ΛSL

Australian Society
for Limnology Inc.

NEWSLETTER

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AUSTRALIAN SOCIETY FOR LIMNOLOGY INC.

The Australian Society for Limnology (ASL) is an Australian-based scientific society whose focus is the study and management of inland waters. The ASL was established in 1961, and has a current membership of over 650 researchers, managers, engineers, teachers and tertiary level students from all states and territories. Members have a strong professional interest in inland aquatic issues, including the maintenance of biodiversity, the maintenance and/or restoration of water quality, and the wise use of aquatic resources. The Society also has a strong interest in fostering the scientific and intellectual development of tertiary students.

The Society includes members working in government agencies, tertiary institutions and many industries related to aquatic resources. Through their daily activities, members have contact with local communities and are in a sound position to interpret and advise on inland water issues. The Society has a substantial knowledge base, and has assumed a responsibility to ensure that this is available to those who manage inland waters.

Accordingly, the charter of the ASL is to further our understanding of Australia's inland waters and to promote their wise use and sustainable management. In this manner we will contribute to the continued existence of this valued resource and the maintenance and enhancement of the quality of life for all Australians.

The ASL regularly produces a newsletter with notes on limnological activities, articles of interest, book reviews and announcements of upcoming events likely to be of interest to Members.

EXECUTIVE OFFICERS 1997-98

President
Dr Pierre Horwitz
Centre for Ecosystem Management, Edith Cowan University, Joondalup, WA 6027.
Ph: 08-9400 5558, Fax 08-9400 5717 Email: p.horwitz@cowan.edu.au;

Vice-President
Dr Jane Chambers
Environmental Science, Murdoch University, Murdoch WA 6150
Ph: 08-9360 2739 Fax: 08-9310 4997 Email: chambers@essun1.murdoch.edu.au

Immediate Past President
Dr Max Finlayson
ERISS, Locked Bag 2, Jabiru, NT 0886
Ph: 08-8979 9756 Fax: 08-8979 2149 Email: maxf@eriss.erin.gov.au

Secretary
Dr Richard Marchant
Museum of Victoria, 71 Victoria Cresent, Abbotsford, VIC 3067.
Ph: 03-9284 0218. Fax 03-9416 0475. Email: rmarch@mov.vic.gov.au.

Treasurer/Membership Officer
Mrs Margaret Hart
22 Netherby Avenue, Wheelers Hill, VIC, 3150.
Ph: 03-9545 3549. Fax: 03-9545 3549 Email m.hart@sci.monash.edu.au

Membership Information and a list of the Regional Executive Officers can be found at the back of this Newsletter

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ASL Home Page

http://www.asl.org.au/

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PRESIDENT'S REPORT

ASL, MEMBERS AND GOVERNMENT PROCESSES

The ASL's broad membership base includes government employees, limnologists working in private consulting firms, employees and students in the secondary and tertiary education sectors, and researchers. This broad-base provides a diversity of value perspectives to any processes seeking to gather well-informed viewpoints on the management of inland aquatic systems. Such government processes produce policies or assist in decision-making in other ways. The ASL is in a unique position of being able to provide formal input into government processes from a variety of positions and the society should make good of these opportunities.

At any stage, any one of us might be co-opted into a government process to provide a perspective representing our particular work-place in an internal, formal way. In fact we are constantly putting our viewpoints forward, and engaging in decision-making processes, in other ways. We are (albeit less formally) influential by feeding ideas and criticisms into such processes simply by participating in laboratory, pub, dinner table, or tea-room debates. We often neglect these forms of contribution, and this is despite the consolidating nature of their operation in the sociology of scientific enterprises.

However, the ASL as a corporate body is not explicitly recognised for these contributions. ASL has its own charter, independent of an agency ethos which might otherwise frame (or constrain) our thinking in our workplace. ASL can, and does, play an advocacy role to maintain the status quo or to seek changes in the way in which Australian inland waters are being managed. The ASL can also provide informed comment by responding to calls for public submissions.

Examples from ASL's 'archives' can be found. For instance, in the early 1970s a proposal to build a hydro-electric dam on the Huon and Serpentine Rivers in south-western Tasmania to inundate Lake Pedder, the southern hemisphere's best example of a lowland glacial outwash lake, produced an outrage from a range of quarters. One of these quarters was the limnological community. Members of the ASL participated as experts in government processes, in public debate, and made submissions to government. While the dams were eventually constructed, and the lake flooded, the formal and informal advocacy role played by ASL members at the time was sufficient to make a significant contribution (to a flow-on effect) to the campaign which ensured that the Franklin River did not suffer the same fate. The example is a dramatic one, and a particularly 'conservation' oriented one; I should say that I might just as easily have chosen a lower key example to demonstrate ASL's promotion of wise-use alternatives for inland aquatic systems.

I draw the analogy because political pressures and demands on water resources are constant, and our advocacy and considered views are as urgent as ever. If any of us need to be convinced of the importance of this we need look no further than the current suite of legislative changes occurring in some states (for instance water reform legislation in Queensland, New South Wales), or the South Australian Parliament's inquiry into the Lower River Murray. A submission from ASL has been, or is in the process of being, developed for each of these government processes. Each submission, like the submissions produced by ASL last year, has been coordinated by interested and enthusiastic

members, circulated to the society's Policy Standing Committee for review, then sent to the executive for eventual ratification. This process will ensure that the President can be confident that the submission has the broad support of its membership.

These sorts of activities conducted by ASL can only be upheld and promoted with the continued enthusiasm of the membership, and the hard work provided by the executive. If you see a role for the ASL in a process near, or dear to your heart, why not involve your scientific society?

Pierre Horwitz
President, March 2000.

NB. Most of these current activities are being aired on the ASL listserver. Are you on the ASL listserver? If not why not subscribe - it's your society!). Details can be found in this newsletter, or visit the ASL's web site at http://www.asl.org.au

GAREUHRHEB

UNIVERSITY OF NEW ENGLAND, ECOSYSTEM MANAGEMENT

As the academic year begins again, a few new projects are kicking off in Ecosystem Management with **Andrew Boulton**. **Leah Watson**, partly funded by New England Antimony mines, is doing an Hons project exploring potential impacts of antimony mining on aquatic invertebrates. The effect is unlikely to be as spectacular as the recent experiment on the Tisza!

Peter Hancock will commence a Masters project funded by DLWC looking at hyporheic processes in response to environmental flows in the Hunter **while Paul Butcher** (PhD) is starting a broad scale project on the response of mudcrab demographics to zoning changes in the Solitary Island Marine Park. Translocation experiments onto BBQ plates and into supervisor's fridges are also planned by one of us. Meanwhile, **Andrew Boulton** continues his ambitious drive to insert cotton strips in every wetland in NSW, presently looking at the potential of this method for measuring 'sediment health' in contaminated estuaries on the North Coast. Hyporheic sampling has extended to sand-slugged rivers in the upper reaches of the Gwydir - first results suggest that the fauna is not as exciting as that down in the Never Never River although rumour has it that **Schminke** found bathynellaceans there in the early 1970s so we remain hopeful.

More on the results, and progress of the 'continuing crew' in the next section - its a bit busy here now.

from

Andrew Boulton

AUSTRALIAN WATER QUALITY CENTRE BOLIVAR

SOUTH AUSTRALIA

Cyanobacteria have been keeping the algal lab very busy over Summer. Sampling frequency has peaked at daily in some waterways. The macroinvertebrate team has seen two staff changes. **Sam Wade** is now full time on sampling and picking instead of 0.6. **Amber Lang** (U of A Environmental Biology Honours) has joined us to fill the position vacated by **Rob Walsh**. We will have completed a major survey of 32 sites on the Onkaparinga River system by the end of March. **Paul McEvoy** has nearly completed the Aquatic Worms of South Australia project with **Adrian Pinder**. Five of our team have had housing changes. **Peter Schulz** and **Tracy Venus** have shifted. **Sam** purchased his unit, **Paul** has nearly completed a new house and **Chris Madden** is extending to accommodate his extending family.

Peter Schultz (O'Schultz today)

MURRAY DARLING FRESHWATER RESEARCH CENTRE

The Northern Laboratory, Goondiwindi

The establishment by the CRCFE of the Northern Laboratory of MDFRC sees the completion of a network of research facilities positioned to study the ecology and ecological management of the Murray Darling in its diverse forms.

The Northern Laboratory at Goondiwindi is near the summer rainfall areas of the north, arid-zone ephemeral systems, and extensive floodplain areas, some of which is currently subject to agricultural development. It is also near major cotton growing areas actively exploring BMP for the industry.

Goondiwindi provides a focal point for some of the developing research issues for the CRCFE 2. Situated on the border, it facilitates collaborative research involving State Government partners of the CRCFE. The Department of Natural Resources and Griffith University both have facilities there with the potential to accommodate the new laboratory.

A Community Advisory Committee, chaired by Leith Boully, has been established and the position of research scientist-in-charge has been advertised. A meeting of the Community Advisory Committee, its first face-to-face, will be held on 18 April after which the CRCFE research at Goondiwindi will become a reality.

New Species Honours MDFRC

A new genus of orthocladiine Chironomideae, *Botryocladius* has recently been described by Peter Cranston (formerely CSIRO Entomology, and Donald Edward, Department of Zoology, UWA). *B. mdfrc* is one of 13 species described, and is in honour to all at MDFRC.

Taxonomy Workshop

The 12th annual taxonomy workshop was held on the 8th and 9th of February at the Nowik Lecture Theatre at the Charles Sturt University's Albury campus and was officially opened by Dr. Nick Klomp, CSU. He provided an entertaining welcoming talk on the world of invertebrate taxonomy from a vertebrate biologists perspective.

About 90 participants attended the workshop, with representatives from all States, eager to be targets for new, invaluable information. The participants came from a wide range of fields such as EPA, various consultancy firms (AWT and NSR), government departments (DNRE), museums, and a wide range of universities. The CRC had 21 attendees, with most partners represented.

The participants were addressed by six presenters covering Australian freshwater invertebrates within the Trichoptera (caddisflies), Megaloptera (alderflies), Cladocera and Odonata (Anisoptera – dragonflies) orders. Ros St. Clair (EPA – Vic) produced two identification keys for four families of

caddisflies. Adding to the caddisfly knowledge, John Dean (EPA – Vic), presented an identification key to a further four families. Gunther Theischinger (EPA – NSW), placed the Australian Megaloptera larvae into a readily useable key. In addition Gunther produced the Australian Gomphidae (dragonflies) larvae into a more up-to-date form. Russ Shiel conducted a session on cladocerans, which will be published soon. The awaited second edition of John Hawking's key to keys was presented and will allow freshwater invertebrate ecologists a more accessible collation of all taxonomic literature. Neil Shepherd (National Association of Testing Authorities - NATA) gave a brief overview of NATA accreditation and its implications for biological laboratories.

A major outcome from the workshop was an informal discussion conducted to identify areas that lack information and require attention, helping to direct future taxonomic advances of the CRC. The workshop is an invaluable interaction for all participants. The skills learned present an opportunity for greater advancement and an understanding of the current literature available.

CRCFE/MDFRC Identification Guides released were:

No. 2	Key to Keys A guide to keys and zoological information to identify invertebrates from Australian inland waters. 2nd edition (1st edition 1994) ..... J. H. Hawking, 2000.
No. 27	Preliminary keys for the identification of Australian caddisfly larvae of the family Leptoceridae ..... R. M. St Clair. 2000.
No. 28	**Preliminary keys for the identification of larvae of the Australian gomphides (Odonata) ..... G. Theischinger, 2000.**
No. 29	Australian Alderfly larvae and adults (Insecta: Megaloptera) Preliminary guide to the identification of larvae and survey of adults of Australian Alderflies ..... G. Theischinger, 2000.
No. 30	Preliminary keys for the identification of Australian caddisfly larvae of the families Odontoceridae, Kokiriidae and Oeconesidae ..... R. M. St Clair, 2000.
No. 31	Preliminary keys for the identification of Australian caddisfly larvae of the families Antipodoeciidae, Atriplectididae, Limnephilidae and Plectrotarsidae ..... J. C. Dean, 2000.

These can be obtained from the MDFRC, Albury.

Congratulations are extended to the following MDFRC people

Helen King who married **Mike Gigney** on Saturday 11 March and to **Terry Hillman** who was informed at the graduation ceremony of La Trobe University Albury-Wodonga campus on Friday 17 March that the University had awarded him the degree of Doctor of Science (honoris causa).

CENTRE FOR WATER RESEARCH/DEPARTMENT OF ENVIRONMENTAL ENGINEERING -

UNIVERSITY OF WESTERN AUSTRALIA

The Swan River blue-green algal bloom

The Microcystis bloom on the Swan River in February caused an unprecedented frenzy of media activity at the Centre for Water Research, with the media demanding interviews and presentations of model results on a daily basis. Perth recorded total 111mm of rainfall in January - 12 times the long-term monthly average. The resultant river discharge flushed brackish water from the upper estuary and part of the lower estuary. The input of fresh water and high levels of inorganic nutrients from river inflows coincided with warm summer water temperatures and resulted in a toxic bloom Microcystis aeruginosa, which necessitated a complete closure of the river for aquatic recreation and fishing purposes for several days. The hydrobiology group, **including David Hamilton**, **Ben Hodges** and **Barbara Robson** attempted to provide predictions of the return of high salinities into the estuary using a three-dimensional hydrodynamic model (ELCOM), and will continue this work by coupling the hydrodynamic model with a water quality model (CAEDYM) to predict the occurrence of the Microcystis bloom. The first ever toxic blue-green algal bloom also confounded Ph.D. student **Terence Chan's** well developed seasonal succession patterns for Swan River phytoplankton. However, a recent Masters thesis on Microcystis by **Brett Wallace** (now at CSIRO Land and Water, Canberra) provided information on understanding the patchy distributions of Microcystis in the Swan River.

Tisza River cyanide spill

The Swan River algal bloom also coincided with the cyanide spill into the Tisza River by part Australian owned company Esmeralda. Once again CWR was besieged by media who sought **Carolyn Oldham** (Contaminant Dynamics Group) to provide commentary from afar on the fate of the cyanide. **Carolyn** returned recently from the University of Stockholm (where she will spend her study leave later this year), delivering seminars at the Institute for Applied Environmental Research and the Department of Geology and Geochemistry. She then attended the Ocean Sciences Meeting in San Antonio, Texas, where she presented a paper on "Convective dynamics in wetlands with reeds".

Harmful Algal Blooms Conference

Anya Waite (Particle dynamics group) also went to the Ocean Sciences Meeting in Texas, and presented a paper called "The unique physical environment of Western Australia". She then attended the Harmful Algal Blooms Conference in Hobart and presented "Cyanophyte blooms in the Canning River" (while the Swan River cyanobacterial bloom was raging).

Postgraduate Research

Kathryn Linge recently had to abort a field trip on normally placid Lake Yangebup due to Perth's recent bizarre summer weather, however, her lab work on arsenic and phosphorus sediment-water interactions powers ahead. **Clare Pullin's** late night (early morning!) lab sessions on benthic fluxes and turbulence, are currently multiplying. Meanwhile, **Terence Chan** is inundated with

Swan River field data, and has become physically attached to his desk (while reminiscing about the sunburn, dehydration and mosquitoes of summer field work), and becoming enmeshed in the Swan River Model (ELCOM/CAEDYM). **Kate Curwen** has developed a particle motion model for a field of steady vortices, and is now planning lab experiments on Microcystis and Anabaena behaviour under turbulence, and **Alisa Krasnostein** is also maintaining a non-melanomic pallor indoors with her numerical water balance model for Thomsons lake, and conceptual models for riparian structure.

New courses

The Department of Environmental Engineering has established a new major in Applied Aquatic Ecology. This course is coupled with majors in Computer Science or Mathematics. The aim of the new degree is to provide graduates who have a fundamental understanding of aquatic ecology and ecosystem management, but who also have expertise in statistical and numerical model applications to aquatic systems.

from

Terry Chan.

WSL

Greetings. This is WSL's first ever ASL scuttlebut and it's about time we finally gave some news of just what butt's are being scuttled by whom around our Richmond biol-lab. From a meagre start of one and a half people working in aquatic ecology, we are now developing an empire (well, of sorts). It seems ironic that as we begin our written offering to the newsletter, we begin to bid farewell to **Shirley Lyons. Shirley** is about to swap her SYSTAT licence for a SCUBA ticket and head out on a tour of the worlds great places. Returning to live in Canada, we will all miss **Shirley** at WSL. Since finalising her travel plans, **Shirley** and Department Director, **Julie Rissman**, have been ensuring that **Kylie Swingler** and **Patrick Maiden** can fill the gaps that **Shirley** will vacate. Both victims of the **Sam Lake** sense of humour and **Downes/Glaister** school of fieldwork, **Kylie** and **Patrick** are keen to get into the autumn sunshine during the upcoming sampling sessions. As I write, **Kylie** is fine tuning her statistical skills writing a biological monitoring report and **Patrick** is completing the biological monitoring program report for a sewage discharge on the Goulburn River.

WSL is also fortunate to have **Danny Vertessy** joining our Biology team. Taking over as project supervisor and dance instructor from **Shirley**, his many years experience in the consulting game strengthens and consolidates the WSL knowledge base. The staff Christmas karaoke party is sure to become the battle of the company rockstars: **Danny** (RAIL), **Patrick** (LOIN GROIN), **Julie** (KORN) and **Kylie** (POPSTARS). Continuing his work with WSL is **Jim Radford**. Having recently realised the futility of chasing treecreepers around the Mallee, **Jim** provides valuable assistance with project design, planning and work in the field. Methinks that if **Kylie** was a contestant on 'Who wants to be a Squillionaire' that **Jim** would be her lifeline.

With more biologists bouncing around the building, management have decided to expand the lab to a premises across the road. We're not sure if it's because we're the only ones in the building not in a lab coat or suit, but we're pretty chuffed about the move. It'll be great to set up the lab from scratch and put desks where we want them and desks the right height (anyone over 6'2" who picks bugs will know what I mean). Another bonus with the move will be more storage space. And just in time. **Kylie** and **Shirley** returned from the Taxonomic conference with another armful of 'Mudfreak' keys.

Don't Forget: Check your local gig guide for your Bug-pickin' rockstars Live in a town near you – **Patrick's** 'Loin Groin' and **Danny's** bluesy country sets.

By **Patrick Maiden**

School of Ecology & Environment, Deakin University, Warrnambool.

Well, it is time for new Honours students, and there are lots of projects in freshwater this year. **Tom McRae** has two starting honours students - **Ben Mutton** is looking at ways of conducting waste water audits for aquaculture facilities, and **Stephen Rees** is going to examine some of the toxicology of environmental endocrine disruptors on yabbies. **Tim Covey's** Honours project is a management plan for the Eumeralla River using GIS, supervised by **Gordon Duff** and **Laurie Laurenson**. **Peter Kew** and **Nick Turoczy** are supervising **Marisa Singh** in a project monitoring the water quality of Picaninnie Ponds. **Tim Forrester** and **Al Danger** have started Honours with **Belinda Robson, Tim** is looking at spatial scales of invertebrate biodiversity in Otways streams and **Al** is experimenting with leaf litter breakdown in pasture vs forest, also in the Otways. **Luke van Unen** just finished a summer project with **Belinda** looking at drought refuges in intermittent streams in the Grampians.

Brad Mitchell has received another 2 years funding to work on the Glenelg-Wimmera environmental flows project. **Brad** and **Ed Chester** will be modelling flows to optimise the environmental benefits of water used for environmental purposes. **Travis Howson** has just begun his Honours looking at fish habitat use in the Wimmera and Glenelg Rivers, with **Brad** and **Laurie Laurenson** as supervisors At long last, **Ed Chester** has also commenced a PhD here at Deakin, looking at CPOM breakdown processes in areas with riparian restoration in progress, in cooperation with the Corangamite CMA, supervised by **Tim Fletcher** (CCMA), **Brad** and **Belinda**.

From: **Belinda Robson**

THE CENTRE FOR TROPICAL WETLANDS MANAGEMENT, NORTHERN TERRITORY UNIVERSITY

Things have cranked up again at the Uni after the traditional wet season hiatus. **Dougo** has returned refreshed and inspired (and with Aussie drawl mercifully intact) after his 6 month sabbatical at the University of Georgia in Atlanta. **Ruth** is (was?) similarly motivated after a 2 month stint in South America (non-limnologically based although I did try unsuccessfully to catch a piranha). The para grass work is winding up with the last emotion-filled trip on the floodplain a couple of weeks ago highlighted by spying on a nest of newly hatched crocs. The write-up is in progress and we're hoping for a final workshop with all collaborators to present the big-picture to stakeholders in April. Meanwhile **Dougo** and **Maryanne McKaige** are busy organising the Asia Pacific Wetland Managers Training Program in collaboration with eriss. So busy in fact that that's about all I know about it.

Finally a big thank-you to all those who responded to my email about the Ord River Stage 2 EIS (I am becoming a fan of list servers). Given the range of limnological issues associated with a 32 000 ha irrigation project on the floodplain of an ephemeral river system, all information was gratefully accepted.

From **Ruth O'Connor**

CENTRE FOR CATCHMENT AND IN-STREAM RESEARCH, GRIFFITH UNIVERSITY, BRISBANE

Heather Proctor is up to her elbows in water mites from the DNR's surveys of Queensland rivers. Together with fish and an array of other invertebrates, mites are a target taxon in the CRCFE Conservation Ecology project on identifying areas of high conservation value in Eastern Australia. Overlaying distribution maps of these taxa should reveal areas of high overall diversity, and may also indicate whether there are aquatic biogeographic realms that complement terrestrial ones.

Stuart Bunn, Fiona Balcombe, Michelle Winning, Stephen Balcombe, Samantha Capon, James Udy and **Peter Davies (UWA),** had a recent field trip to Cooper Ck as part of an Environment Australia Environmental Flows Initiative Program investigating the importance of flood flows to productivity Sampling coincided with initial floodplain inundation during the recent Western Qld floods and involved measurements of primary production, fish, algae and invertebrate collections. **Peter Davies** wins the nature conservation award for his recognition that the uncomfortable ball of mud stuck in his shoe all day was actually, by that stage, a disfigured, large green water-holding frog.

We welcome **Fran Sheldon**, and **Claire McKenny** and **Mick Smith** to CCISR. **Fran** has relocated from Adelaide and is continuing her work on dryland rivers. **Claire** is starting her PhD on bugs and nutrients in the upper Brisbane River catchment, supervised by **Fran** and **Stuart** (more next issue). **Mick** is co-ordinating a project in participation with DNR, EPA, CCISR and various shire councils which aims to find the most effective ways of monitoring water quality in S.E Qld. **Samantha Capon** has returned from holidaying in India to start her PhD which will expand on her honours study of the floodplain zonation of riparian plants.

From **Stephen (Harry) Balcombe**

FASTS

IN SUMMARY

This year (1999), FASTS has
* met with Minister David Kemp
* released the Ten Top Issues
* held detailed discussions with officers of ISR on a range of policy matters
* media coverage on the Innovation Summit, Minister Kemp's White Paper, the death of Malcolm McIntosh, commercialising science, the brain drain and the decline in government funding for universities in the Australian, the SMH, the Financial Review, ABC radio, the Age, the Telegraph
* assisted Member Societies with media releases
* written to Minister Minchin on the brain drain issue
* met with key Parliamentarians to discuss science issues
* participated in the Innovation Summit

1. INNOVATION SUMMIT

The Innovation Summit has come and gone, and worked better than most people expected. I attended as President of FASTS, along with Past-President Peter Cullen, FASTS' Executive Director Toss Gascoigne and Board Member John Pilbrow.

There was a positive mood during the three days, despite the absence of any hard announcements (Minister Minchin missed a big opportunity to offer something in his final statement. It didn't have to be big, just a sign...)

It was a big plus to have the attention of Australia's politicians focussed on research and innovation, if only for a week. The Summit was addressed by Cabinet Ministers Minchin, Alston and Kemp, as well the Prime Minister.

In addressing the dinner, the Prime Minister said that people interested in innovation would be entitled to judge the Government by its actions.

Given that the Government has presided over a period of plummeting rates of business expenditure on R&D and a university sector facing varying degrees of crisis, it is hardly in a position to stand on its record. Its strategy of trying to starve the universities into innovation has been a failure.

In fairness to the Government, some of these problems were inherited from the previous administration.

The Prime Minister's statement has been widely interpreted as a strong hint of good things in the air. Certainly he succeeded in raising expectations across the sector.

There was broad agreement on what has to happen before Australia can take full advantage of our high-quality science. The final reports of the thirteen breakout sessions are peppered with words like "broad support ... consensus."

General agreement on steps to be taken was characteristic of the event. The degree of unanimity probably surprised delegates, given their different backgrounds in the business, Government, higher education and research sectors.

The Summit opens up new possibilities for Australia. If it is to be judged a success, the Summit must lead to:

a. increased national investment in research
b. change the reward structure in research organisations, to encourage innovative behaviour
c. a new culture which recognises R&D as the driver of innovative industries
d. mentoring and incubators to assist commercially-minded scientists and technologists
e. structures to encourage movement between industry and research organisations
f. more realistic and sophisticated handling of IP issues

We are told that this year's Budget will be tight, but the Government needs to start now. The issues have been well analysed- what's missing is the funding to accompany the rhetoric.

Further information on the Summit is available on the ISR web site.

2. "SCIENCE MEETS PARLIAMENT" DAY

We invited all Federal politicians to meet a pair of scientists from their electorate last year, and response was overwhelming. One hundred and forty Parliamentarians (two-thirds or the total) agreed to meet with 170 scientists from all over Australia.

Participating scientists were very positive, scoring the overall event at eight and a half out of ten. A clear highlight was meeting Parliamentarians. Scientists were impressed (and surprised) by their general grasp of issues, and the value they placed on investing in S&T. The meetings often lasted longer than the scheduled half hour, another good sign.

Science education issues were the most popular topic, mentioned in nearly half the meetings. Fifty MPs were asked how science was travelling, and 42 of them responded "not well". For some, the problem was lack of funds; others blamed scientists' poor communication with the public.

The Physicists made great use of the Day by scheduling a meeting of the AIP in Canberra that week. This meant they were able to stay on for SmP Day at minimal cost.

FASTS discussed S&T issues with Senator Grant Chapman (SA, Chair of Liberal Party ISR Policy Committee) and Danna Vale MP (Member for Hughes) over dinner last week. Developing closer links with prominent backbenchers who have demonstrated strong interest in science and higher education issues complements our relationships with Ministers, shadow Ministers and bureaucrats.

Watch the FASTS' web site for a full report: www.usyd.edu.au/fasts/

3. FRESH SCIENCE
ScienceNOW! is seeking 16 young-ish scientists to talk about their research to the media and the general public at ScienceNOW! in Melbourne from May 4 to 7.

They want good peer-reviewed research by scientists without a public profile but with the ability to tell a good story. Research must have been conducted in Australia or by an Australian, must have been released since 1 January 1999, must have gained peer recognition, and must NOT have had significant media coverage.

The selected researchers will be flown to Melbourne and provided with training and media support. The event last year attracted over 150 media mentions.

For further information: www.sciencenow.org.au
Or contact Niall Byrne: 03 5253 1391, fax 03 9923 6008, e-mail: niall@byc.com.au

4. PRIME MINISTER'S SCIENCE COUNCIL
I attended my first meeting of the Prime Minister's Science Council last November. This is an excellent opportunity to raise issues on behalf of Australia's scientists and technologists with the Prime Minister and his cabinet.

I am chairing a working group preparing a presentation on Science and Technology in Fighting Crime, with a report to be presented to the June PMSEIC meeting.

5. SUPPORT FOR VISITORS TO AUSTRALIA
The rules governing ISR's Technology Diffusion Program seem to changing, and it should be considered a possible source of funding to bring top overseas speakers to Australia.

Applicants need to demonstrate that this will promote innovation and industry competitiveness by helping industry and researchers to access and adopt new and leading edge technologies.

Further information ON TDP: www.ausindustry.gov.au/tdp or by calling the AusIndustry Business Hotline on 13 28 46

6. MEETING WITH DAVID KEMP
Ken Baldwin and I met David Kemp as part of the "Science meets Parliament" Day event. The discussions were friendly and useful, and we are following up several points by correspondence.

7. NEW FASTS POLICY DOCUMENT
The new Policy Document was launched late last year in Parliament House, and formally presented to Minister Minchin who promised a comprehensive response from his Department.

Clearly the Document is valued contribution to policy formulation. In our discussions with ISR officers it has been described as a "great basis for all sorts of decision-making".

Thanks to Ken Baldwin, Chair of the Steering Committee, for steering the Document through. It is available as a pdf file on our web site, or in hard copy from the FASTS' office.

8. DISCUSSIONS WITH THE DEPARTMENT

We have had a series of meetings with officers of ISR officers. FASTS has earned the confidence of ISR, and we are able to talk constructively on a whole range of issues.

Matters raised in the most recent meeting included: measuring the brain drain a scheme to fund major national research projects detail in the FASTS' Policy Document a consolidation of cost-benefit analyses of Australian research

FASTS will react to the Budget more quickly and more accurately this year, after arranging a Budget night briefing from the Minister and officers of his Department.

9. TEN TOP ISSUES FOR 2000

The list was released in mid-January and is available from our web site.
The 10 selected issues are:
Invest in the future
Science for the bush
More science and maths teachers
Brain drain becomes express train
Keeping Australia in touch
Establish the future of the CRC program
Bringing the boys (and girls) back home
A national map and compass
Reversing the decline: industry investment in R&D
Changing the culture through science awareness

10. FASTS' BROCHURE

We have a new version of the FASTS brochure available. The flyer sets out the benefits of membership, and lists our Members. Some Societies have posted the brochure out with their newsletters. If others would like to do this too, copies are available from the FASTS' office.

10. CSIRO AND MALCOLM MCINTOSH

The death of Malcolm McIntosh will be universally mourned through the world of science and technology. He won the respect and admiration of the Australian community, and was a rare person who could command the same respect in the laboratory and the Cabinet office.

FASTS hopes the Minister is able to make a speedy appointment to this key position, as challenging issues face CSIRO.

11. NEUROSCIUENCE SOCIETY AND THE FASTS' LECTURE

The Neuroscience Society presents the FASTS' Lecture as a major invited talk at its annual conferences. These public lectures have attracted good media coverage, and FASTS is able to assist with the drafting and distribution of a media release.

This offer is open to any other Member Society which would like to add the FASTS' Lecture to their program.

Sue Serjeantson
President
18 February 2000

AUSTRALIAN INVESTMENT IN SCIENTIFIC INSTRUMENTS FALLS

A survey of companies supplying scientific instruments to Australian industry and research bodies has found a significant softening in demand in their most recent audited survey.

Sales of analytical instruments such as mass spectrometers and gas chromatographs plunged to their lowest levels since the survey process began in January 1997.

On a scale indexed for foreign exchange rates, most recent quarterly sales measured 89 against a base rate of 100 in 1997.

The survey is commissioned by the Scientific Suppliers Association of Australia, an industry body representing 90 companies with total sales of about $1 billion per annum. It measures quarterly sales by a representative group of companies.

The surveys are conducted by PricewaterhouseCoopers.

Mr Alan Lawrenson, Manager of the SSAA, said that the plunging sales for analytical instruments and flat sales for other scientific products indicated that Australia is losing ground in the battle for international competitiveness.

"These sales cover a period when our competitors overseas are making massive new investment in science infrastructure," he said. "We have to run faster just to maintain our place in the international pecking order."

Mr Lawrenson said a further indication of sector activity would be provided by industry response to The Millennium Science 2000. Over 2500 laboratory managers and scientists are expected at this event, to be held at the Rosehill Function Centre in Sydney from March 21-23

He described it as Australia's largest scientific event for professional scientific staff. It features seminars and technical discussions as well as a trade exhibition.

Mr Lawrenson said there are signs of hope on the horizon. The Innovation Summit had sparked calls for increased investment in research and modernisation of equipment.

"Our members are hoping recent Government measures like the reduction in capital gains tax will encourage activity in this sector, but there is a lot of lost ground to make up," he said.

Professor Sue Serjeantson, President of the Federation of Australian Scientific and Technological Societies (FASTS), said her members are concerned about the steady erosion of facilities and equipment in Australian research organisations.

"Universities are increasingly operating on outdated and failing equipment which reached the end of its useful life a long time ago," she said. "Baling twine, Aussie enterprise and goodwill can carry our research effort only so far. It's time to put dollars into science."

$3.6E^{15}$ ATTOSECONDS

ASL Executive Meeting at Wairakei, NZ, on 29 Nov 1999

Present:P.Horwitz, R.Marchant, J.Davis, J.Chambers, K.Muller, D.Nias

1. New executive: at the forthcoming AGM the president suggested putting forward a motion to re-elect the existing executive. This would save time and was in keeping with the suggestion made in the Futures Document of moving towards a two year term for the executive.
2. Constitutional problems: the secretary explained that to retain the society's non-profit status it is possible that the winding up clause in the current constitution needs modification. He also noted that the current rules from the Victorian Office of Fair Trading and Business Affairs required the society to hold an AGM within five months of the end of the society's financial year (31 Dec). The secretary will investigate both matters and report back to the executive.
3. Fee increase: M.Hart suggested a fee increase at an earlier executive meeting in 1999 to cover the increased costs associated with the introduction of the GST. After some discussion the executive agreed that ordinary fees should increase to $40 and student fees to $20.
4. Newsletter: the editor, I.Growns, in his report to the AGM will mention electronic transmission of the newsletter. The executive agreed that a model for such transmission should be prepared by the executive and brought to the next AGM in 2000.

ANNUAL GENERAL MEETING OF THE ASL AT WAIRAKEI RESORT, NZ, 30 NOV 1999

(p = proposed, s = seconded; attendance = 51 members)

1. Adoption of agenda (p = T.Doeg, s = D.Nias), carried.

2. Apologies: M.Finlayson, R.Butcher, D.Nielsen, M.Hart, I.Growns, M.Brock.

3. Minutes of last AGM: accepted (p = K.Muller, s = J.Chambers)

4. Matters arising from minutes: none.

5. **President's report**: ASL has had a successful and busy 18 months since the last AGM. Some key initiatives have been presented in the recent issues of the Newsletter. Foremost amongst them have been the formation of a Policy Standing Committee which continues to ge nerate ideas and potential activities for the Society. It is essential that the Executive initially, and the Society in general, respond to these ideas and proposals in order for the Society to keep moving forward. This means that members of the Executive need to be willing to actively contribute. Fortunately the current Executive has been wonderful to work with in this regard; nevertheless, there is, I think, a general feeling that the State representatives on the Executive are there to provide material for the Newsletter and that's about all. I think we need to think carefully about the roles of state representatives on the Executive, to diversify the role that they play in the Society. To this end we hope to work over the next 6 months or so to draft 'duty statements' for future members of the Executive.

The web site has been a major achievement for the Society, mainly thanks to the voluntary work of Simon Josey. His hard work, and the number of 'hits' received by the home page (an average of 90 per day over the last 5 months) has emphasized the importance of an electronic home for the Society, and the importance of having a keen web master! The increase in membership over the last few years shows that the Society provides tangible benefits to its members, something we can all be proud of, and continue to provide. Report accepted (p= R.Marchant, s = J.Growns).

Secretary's report: Three executive teleconferences were held since the last AGM (in Nov 98, March 99 and Sept 99). The minutes of these have been published in the newsletter. The secretary is still trying to accumulate information on the history of the society. Thus anyone with useful historical information is asked to contact the secretary. Some of this information may be placed on the ASL web site. Copies of three special publications are still available from the secretary: no. 11 (mayfly catalogue), no. 10 (aquatic cryptogams) and no. 8 (Tasmanian stoneflies, one copy only). Report accepted (p = P.Horwitz, s = K.Muller).

Treasurer's report: "The membership of the society has grown reasonably well over the past year: from the humble beginning of 64 members in 1962 to 636 members today. The society should be pleased with the growth, but there is always room for more members. This year a number of our newer members have joined using the Web based system. This process I am sure will become more popular as time goes on. The membership as at the 30 November 1999 is as follows:

Life members: 25

10 year member:	18
Ordinary members:	455
Student members:	119
Institutional members:	19
Total:	636

Taking into consideration the impact of the introduction of the GST, particularly on printing, FASTS and the general operating costs of the society, I would suggest a minor raise in the subscriptions for the year 2000 and beyond.

Members from $35 to $38
Students from $17.50 to $20.00
10 years $325 to $355
Institutional $40 to $45.

The membership directory will be produced in the December issue of the newsletter. The financial statement follows. Thank you to members for their support over the year. I offer myself for the position of Membership/ Treasurer Officer of the Australian Society for Limnology Inc for the year 1999/2000." Report accepted (p = J.Chambers, s = R.Shiel). The president proposed a slight alteration to the fee increases suggested by the treasurer: $35 to $40 (instead of $38) for ordinary members. There was some discussion of these increases but when voted upon they were agreed to unanimously.

Honorarium for treasurer: R.Marchant proposed $1500 honorarium for M.Hart (s = R.Shiel); carried.

Auditor's report: "In our opinion the financial report presents fairly the financial position of the Australian Society for Limnology Inc. as at 31 December 1998 and the results of its operations for the year then ended." Signed Lindsay C.Coster FCA, chartered accountant. This was accepted (p = R.Marchant, s = P.Horwitz).

Editor's report: There was no editor's report this year; no special publications have been published since 1997. Ann Grant (CSIRO editor for Marine and Freshwater Research) announced that the 50th anniversary issue of MFR would be published in the next few weeks and encouraged ASL members to use the MFR web site for more details about the journal.

Newsletter editor's report: "Three issues of the newsletter have been published during 1999 and a fourth will be posted shortly. The number of members receiving has varied from just over 600 to about 640. Each issue in 1999 has been posted on time. However, some members may have received their issues in the following month due to the slow delivery of using the Australia Printpost service.

Member contributions have been variable over the last year. A plea for material for the gossip section was met with lots of material for the June issue. This demonstrates that the membership is receptive to giving material when prompted. The States vary considerably in their contributions. Victoria and NSW always provide stuff but getting people to give material to Jean Jackson (Tasmania) is very hard.

Kalianna Pty Ltd in Albury are now providing the bagging and posting services and Border Multi Print in Wodonga are the printers. Both companies are proving excellent services and there have been no hitches to date.

The regular features have changed slightly over the year, with the Bibliography Section being removed due to lack of support. I do not feel that this is a major issue because modern literature searches are very powerful and the majority of members have access to the internet. I am disappointed in the lack of support for the Bibliography as other newsletters from scientific organisations, such as Australian Society of Fish Biology or the Ecological Society have good Bibliography sections.

The feedback from conferences could enjoy more support. I have tried in the past to commission material from people at conferences to write for the "I've been to" section. However, some people have been hesitant to write stuff and others say they will write something but never do. I will endeavour to increase this section in 2000.

Our witty freelance correspondent, Tim Doeg, has provided the newsletter some wonderful material during 1999. I hope he continues to provide us with material during 2000.

I am happy to continue in the position of newsletter editor for the next year."
The report was accepted (p= D.Nias; s = J.Gooderham). I. Growns was congratulated by a number of members for the splendid job he was doing.

6. **ASL Medal report**: P.Horwitz reminded members that the inaugural medal was awarded at this conference to R.Shiel. The new process for nominations clearly works and should be used in the future.

7. **Student travel awards**: R.Marchant announced that 15 students had been supported to attend and present their work at this conference. They were: (from WA) S.Tjokrokusumo, K.Sutcliffe, M.Pennifold, D.Thomas, S.Thompson; (from NSW/ACT) L.Oswald, B.Lowe, G.Johnstone, L.Evans, T.Rankin; (from Tas) D.Warfe, D.Turnbull; (from Vic) S.Treadwell, S.Schreiber; (from SA) M.Bald. A total of $4500 was distributed to these students.

8. **Student prizes** (announced later at the annual diner): The Ph.D award was given jointly to: Sabine Schreiber (Monash University) and Mardi van der Wielen (University of Adelaide); the Honours award to: Nelda Sale (University of Adelaide); the Poster award to: Megan McGuire (Murdoch University). The very high standards of oral presentation by students, especially for the Ph.D award, made the judges' choice difficult. Hence the decision to have joint winners was necessary.

9. **Door prize** (also announced later): This was awarded to Michelle Bald. Her achievement and those of various runners up were explained in full by T.Doeg.

10. **39th Congress**: A proposal to host this in Darwin by N.Rea and M.Finlayson in July 2000 was announced by P.Horwitz.

11. **Future congresses**: For 2001 a meeting on the Murray, possibly at Echuca, was suggested and for 2002 a meeting at Margaret River in WA was proposed by M.Lund and enthusiastically supported.

12. Election of the executive: P.Horwitz proposed (s = R.Marchant) that the entire executive be re-elected until the next AGM. This was carried unanimously.

13. Election of auditor: R.Marchant proposed (s= K.Muller) that Coster Galgut be re-elected. This was carried.

14. **General business**:
    (a) Name change report: J.Chambers outlined the results of the postal ballot (the voting was summarised on pp34-35, vol 37, no. 3, of the ASL newsletter). The three recommendations from this ballot: (i) that the name of the society should remain the Australian Society for Limnology Inc.; (ii) that a catchy marketing type statement be added as a subtitle to the name of the society; (iii) that the executive be charged with finding the most appropriate means for promoting the word limnology to the public; were put to the vote. All were carried (with one against for (i)).
    (b) Honorarium for webmaster: R.Marchant (s = J.Puckridge) proposed an honorarium for S.Josey the webmaster. After some discussion this proposal was modified and L.Barmuta (s = J.Roberts) proposed that a once-off honorarium payment be made to the webmaster and an examination of continuing expenses be made. This was carried. Members proposed a vote of thanks to M.Douglas for setting up the web page and list server initially.
    (c) Electronic Newsletter: the executive will bring to the July 2000 AGM a model for an electronic newsletter.
    (d) Policy sub-group report: T.Doeg summarised the top 10 limnological issues (see ASL newsletter pp 32-33, vol 37, no. 3 for more details on the policy standing committee). These issues and comments received so far will be outlined in a future newsletter article .

Meeting closed at 7.10pm; R.Marchant, secretary

A POSTCARD FROM THE FREE MARKET

AN OCCASIONAL SERIES BY TIM DOEG

WHERE THE HELL DID THAT NUMBER COME FROM?

Science is full of numbers. The speed of light, the mass of an electron, the distance to the nearest galaxy. Such numbers are quoted often and they are always the same number. While we see these numbers repeated often in text books and papers, we rarely see how they were derived. It is assumed that they have been measured carefully and often, refined and checked, so that such fundamental numbers are accurate. But how do you measure the speed of light? How do you weigh an electron? Who has a tape measure long enough to get to the nearest galaxy? One simply accepts oft-repeated numbers as accurate and defensible.

Limnology is the same. Many numbers come up regularly that take on credence with repetition. Unfortunately, some of these numbers seem a little dubious under scrutiny. The value of 20 metres for a suitable buffer strip along streams to protect ecological values has been repeated often in Victoria Every one from scientists to catchment managers to loggers with chain saws knows that number.

We consultants just love numbers like this. Asked for advice on river management and objectives, we can turn to these figures as definitive statements of goals and can cite report after report that repeat the number. With such widespread agreement, it is obvious that such values must have been determined scientifically and tested often and proved adequate.

But where did it come from? Actually, no-one quite knows. Talking recently with a friend who was part of the original Code of Forest Practice determination in Victoria, the 20 metre figure was allegedly selected because it was about a chain – the old public reserve width along streams – and was a loss of resource the industry would accept. Not quite the scientific basis that one would expect.

Similarly suspended solids. In an old EPA set of guidelines, a limit of 25 mg/l (90^{th} percentile) was set for high level protection of aquatic ecosystems. Where did that number come from? Well, it can be tracked back to the USA as a value for that gives good production of trout. Which in turn was derived from European figure that gives good production of warm water fish. The number simply seems to have travelled around the world being adapted and adopted for a variety of uses and objectives, without local validation or testing.

More recently, I saw a reference that suggested that 125 mg/l would be a good target figure for suspended solids to protect the environment. That was a bit of a shock, because it was a number that I came up with as the mean suspended solids concentration delivered to a single experimental channel that increased macroinvertebrate drift. One experiment, unreplicated, a short note in AJMFR on an interesting result. A few more citations and the number could become the new gospel figure.

In environmental flow determinations, one often sees a value of the 80th percentile exceedence flow, or 20% of the Mean Annual Discharge (MAD) as a suitable minimum flow below reservoirs or diversions. There is an old flow method developed for salmonids in Montana (USA) that concludes that a minimum flow of 20% of the MAD would produce good conditions for trout production, and another from Colorado that suggests that the 80th percentile exceedence flow would be good enough for trout food production.

Like most of these numbers in limnology, they are initially transferred to Australian conditions heavily qualified with statements on the need to verify them under local conditions for local species, qualifications that are subsequently dropped as the values gain credence or are actually used (even I plead guilty to this).

So where is this leading. At the next ASL Congress in Darwin, we are to have a session looking at the Snowy River and environmental flows. Currently, only about 50 Ml/d 1% is passed down the Snowy River from Jindabyne Dam (the 1% of the natural flow). Time and time again, I have seen quotes and comments from various players along the lines of "The Snowy River needs 28% of its flow returned according to the experts" or the alternative that "The Snowy will do fine with 15% of its flow according to the Snowy Water Inquiry".

These 15% and 28% figures have been adopted by the debate about the Snowy River and are being presented as two scientifically derived alternatives. But where did these numbers come from?

The 28% value supposed arose from an Expert Panel assessment of a suitable environmental flow in the Snowy conducted by the Snowy Genoa Catchment Management Committee in 1995. As far as I can see, the value of 28% does not appear in the report. What is recommended is a minimum flow of 200 Ml/d or natural (if inflow is less) based on the 95th percentile exceedence flow for the driest month prior to regulation, an average daily base flow release each month approximating the 95th percentile exceedence flow for the month , a 3 to 5 day flood flow event between May and October with a minimum peak of 12,000 Ml/d (based on thresholds of motion for stabilised sediments) and stopping diversions from two downstream tributaries to restore some natural daily variability.

So the 28% figure is a gross simplification of a recommended flow regime. And the recommended flows are based on percentile exceedence figures that should produce better in-stream water conditions (and therefore hopefully improved biodiversity). It is noted that the recommendations are based on the best available information and scientific expertise (correct), is consistent with a precautionary approach in ecological management (good) and future flow management should be adaptive to take account of improved ecological information over time (i.e. we might be wrong).

The 15% value is often quoted as a recommendation from the Snowy Water Inquiry. It is not. What that Inquiry was meant to do is examine the environmental, economic and social aspects of different environmental flow options for managing the 10 rivers affected by the Snow Scheme and provide the governments of New South Wales and Victoria "with fully costed options for dealing with environmental options arising from the operation of the Snowy Mountains Hydro-electric Scheme and the impacts of those options on other water users." (p. 47 – Final Report). None of the Terms of Reference for that Inquiry deal with making a recommendation. A large number of scenarios were developed for future management of each of these rivers and these were analysed. From these, 23 options were selected for public comment. These options were combined into seven Composite Options dealing with the entire scheme.

And the 15%? Well, in the Commissioner's Analysis and Conclusions, he concludes that the key factors in evaluating the options should be that significant environmental gain should be achieved, water wastage reduced, minimal cost impact on agriculture, manageable impact on electricity generation and reasonable capital cost impact. On page 7, it states "As a result, I have nominated Option D as ***my*** preferred Composite Option for implementation by the Governments." (my emphasis).

So the 15% is a personal opinion from the Commissioner of the Inquiry.

We consultants (and journalists, and managers) should really be very aware of where these numbers we quote so often come from. And we need to be very careful about promulgating numbers as fact, or using second hand reports to pass on numbers, or producing misleading simple summaries of complex recommendations, conveniently forgetting about the qualifications that should accompany those numbers. Because often they take on a life of their own and can become accepted without good justification.

Well, I reckon the Snowy River needs about 67.5% of its flow returned to achieve any sort of measurable improvement. There, quote that!

ANNOUNCEMENTS

ASL Door Prize Report – Lake Taupo 1999

PRESENTED BY TIM DOEG

After 16 years of the Door Prize (the inaugural award was made at the Mt Gambier conference in 1983), the award is now one of the more sought after honours in the ASL calendar. For any new members, the Door Prize is awarded at each conference for the event, person, talk, action (or basically anything that the Door Prize Collective decides is worthy – we give the prize, we make the rules!) that contributes most to making the conference a memorable event. While you may have forgotten Leon Metzeling's talk on "A rapid approach to monitoring streams using macroinvertebrates" at the Rottnest Island conference in 1994 (aha, is that where all this rapid assessment stuff started!), few could have forgotten Rob Dupe falling asleep on the conference venue lawns, only to be rudely awakened in the morning as the recycled sewage sprinkler system went off in his face.

This year, being the first overseas venture by the ASL, and the first joint conference with our New Zealand colleagues, the Collective was seriously concerned that ASL members would remember the Foreign Affairs Department advice that we are travellers, and as such we are ambassadors for our country and would be on our best behaviour (let's not give those New Zealanders more ammunition). The Collective is however proud to announce that these fears proved to be totally unfounded, and members behaved perfectly normally. Hence many fine nominations were received this year.

One of the themes that ASL has been tackling over the past year is that of communication; how to get our message to a wider audience. In that light, the Door Prize nominations for this year have taken the communication theme.

That is not to decry worthy attempts at nomination for memorable activities such as dancing on tables, whip cracking, a bunch of Australians putting themselves in the hands of a powerful jet boat run by an All Blacks supporter (whoops ... don't mention that sport!), various activities associated with golf, and late night interactions with the locals.

And so to this years nominees:

The word "Limnology" has been seen as an impediment to successful communication. Part of the debate on the name change was to do with the word. The **Let's make Limnology a household word nomination** goes to the conference organisers who decided that the most effective way to overcome this was to .... change the spelling! Surely, simply adding an extra "i" between the "m" and the "n" would make the word more meaningful (for those not at the conference, check out the souvenir drink bottle).

As an aside, it would appear that a number of words have become redundant in the past 12 months. For example, it would also appear that the word "flat" has gone out of favour, now to be replaced with "topographically subdued" as suggested by Pierre Horwitz.

The **Effective communication between scientists and managers nomination**, awarded to those who best make the technology transfer between scientists and managers, is awarded to Leon Barmuta for his simply understood description of a flow as "a separation bubble, a zone of boundary layer reattachment, and a horseshoe vortex". One can just hear water managers throughout Australia heeding the call and we can expect the next version of stream management manuals having the objectives of "More separation bubbles" as an action to enhance stream biodiversity.

Effective communication in the International Sphere is another important aspect of promoting the ASL. This years nomination goes to Sabine Schreiber for hi-jacking a bus-load of Dutch tourists in Lake Taupo. The less generous amongst us would see this as a desperate attempt to get a group of Monash limnos back to the resort at the cheapest cost, but clearly, Sabine saw that the chance of converting an entire bus load of Dutch to the limnological world is far preferable to the chance of merely converting one New Zealand mini-bus driver (who, while undoubtedly impressed, would probably expect more than just inspiration for the trip).

But the winner is:

Every now and again, an individual goes to great lengths in order to get their message across to the largest audience With 4 concurrent sessions, that means that there are 3 groups out there who will not hear a particular talk. To the speaker, this is clearly an indication that they have misread the program and simply gone to the wrong room. Too embarrassed or polite to stand up and leave during the talk, the listener will have to endure the wrong talk and miss the one they obviously wanted to hear. How to get the message across to them?

We've seen the use of considerable high technology during this conference (with varying degrees of success). So why not use that technology to best advantage? As Jane Growns was about to start the very first talk on the very first day, as she opened her mouth to talk, the voice came booming out of the loud speakers:

"I want to talk to you about constructed wetlands, for they are very important."

Clearly the speakers were distorting Jane's voice (it didn't sound like her) and it would have been nice if they told us she had changed her talk (I wanted to know about snags). Hang on! Now she wasn't even moving her lips, but the voice kept going.

"You can get nutrients out of the water by passing it through wetlands ..... we have great results ... and what's the best way to get nutrients out of water? ...."

And the voice went dead. And we sat there. You could tell that all we wanted to hear was the answer. Brilliant strategy, that one. Tap into the P.A. system, take over the communication system and broadcast your talk to all the other sessions (who really meant to be at your talk). Present some great results and cut it off just at the important bit.

So, congratulations to this years winner, for a communication effort that just went that little bit further ....

Michelle Bald.

AUSTRALIAN WETLANDS FORUM

The inaugural Australian Wetland Forum is an opportunity for interested wetland scientific and conservation groups to develop a consensus-based document on wetland conservation and management in Australia for the next decade. A specially convened meeting, linked with ASL 2000 in Darwin, will set this agenda for wetlands. Invited expert talks and workshop discussion sessions dealing with wetland ecology, management, and government policy, will build on an initial draft document prepared for the day. The final form of the document will reflect the consensus of the meeting. Thus, it will be 'owned' by the meeting, not by any one stakeholder at the Forum.

Each stakeholder will be able to use the document or a component of the document as related to their personal agenda or needs. The document will be short and produced in plain language and widely circulated to primary stakeholders, agencies and wetland users, owners and managers.

The meeting would have an open invitation. Costs could be sought from government sources and through registration fees, with logistical support being sought from appropriate local organisations.

The document produced by the Forum will be aimed at general users and managers of wetlands and the general public. It would outline specific strategies for Stopping and Reversing the Loss and Degradation of Australian Wetlands, with major actions listed and described. Several models are available from elsewhere around the globe - for example, the Mediterranean Wetland Program and the Canadian Environment Roundtable, but the output will be very much tailored towards Australian needs.

The Forum could potentially provide a means of commenting on existing and future policy and actions, provide input to government programs, and extend communication as is being promoted in other fora such as the Wetland Care meeting in late-1999.

Announcing the ASL Congress 2000 in delightful tropical Darwin, Northern Territory 7–10 July 2000

Where is it? Mal Nairn Auditorium, Northern Territory University

When is it? Registration 6 July 2000
Congress sessions 9am–5pm, 7–10 July 2000

Theme An assessment of limnological science in Australia in the next millenium

Special sessions Sustainable development of wetlands in tropical Australia
Environmental water flows in the Snowy River
Australian Wetland Forum

Sponsored by National Centre for Tropical Wetland Research
- Environmental Research Institute of the Supervising Scientist (*eriss*)
- NTU Centre for Tropical Wetlands Management
Northern Territory University
NT Department of Lands, Planning and Environment

Congress fee The congress fee is GST-inclusive and covers lunch, am/pm teas, bus transport and logistical costs for four days:
$215 (ASL member)
$240 (ASL non-member)
$160 (student ASL member)

Papers & posters Please submit 200 word abstracts or poster topics to Abbie Spiers (abbies@eriss.erin.gov.au or fax 08 89792149) by 26 May 2000. Papers and posters on all aspects of limnology are invited, in addition to those that address the theme and special session. A prize will be offered to the most outstanding student presentation.

Accommodation Please book your own accommodation in Darwin. A range of accommodation options are attached to assist you. Please book early as it is perfect dry season weather in July and therefore a very busy time of year!

Transport

Upon arrival, you may wish to use the airport shuttle service which operates regularly from the airport to many hotels and backpacker lodges. We will provide daily bus transport at set times between the city and the congress venue.

Registration

Please complete the ASL Congress 2000 registration form available on the ASL web site (http://www.asl.org.au) and send a cheque or money order for $215 (ASL member), $240 (non-member) or $160 (student member) fee to:

Collector of Public Monies
Environmental Research Institute of the Supervising Scientist (*eriss*)
Locked Bag 2, Jabiru, NT 0886 AUSTRALIA

Note: Please ensure that the cheque/money order is accompanied with a note clearly indicating its sender and the fact that it is payment of ASL 2000 registration. If you cannot access the web-based registration form, please contact Abbie Spiers for a hardcopy form (tel. 08 89799793, email abbies@eriss.erin.gov.au)

Congress dinner

The congress dinner will be held on the lawns at local restaurant 'Pee Wee's at the Point', 7pm Saturday 8 July. Music and a delicious buffet is offered for $45 each (purchase own drinks from the bar). Bus transport will be provided for the evening between the restaurant and city and university accommodation.

Post-congress tours

Several 1-day tours will be offered following the congress:

- The '*Daly River Technical Tour*' will focus on environmental flows, visiting the spectacular Daly River and a major tributary, Douglas River, and discussing the developmental issues associated with the area. Of course there will be plenty of time for a stroll along the river bank and a swim!
- The '*Mary River Tour*' will visit the barrages on the Mary River system and highlight management issues such as saline intrusion and multiple-use of tropical wetlands. This tour could include a spot of fishing or join a birdwatching boat cruise along the beautiful Mary River.
- Information on other tour options (e.g.Litchfield or Kakadu National Parks) is available on request from conference organisers, the Northern Territory Tourism Commission and all hotels/motels and backpacker lodges in Darwin.

Special Event

In collaboration with various other interest groups ASL will assist in hosting the first meeting of the Australian Wetland Forum on Saturday 8 July 2000, Darwin.

The forum will provide an opportunity for all interest groups and individuals to develop a strategy to Stop and Reverse the Loss and Degradation of Australian Wetlands.

Invited speakers will be asked to address specific themes that will provide a basis for discussion and developing the strategy. Audience participation is critical and will be encouraged through discussion sessions and the release of draft materials before the meeting.

This is an opportunity for you to have a comment on the future of Australia's vital wetland resources. Wetland managers, owners, users and researchers are encouraged to attend and have their say.

Further details will soon be made available.

All welcome!!!

For more information please contact
Abbie Spiers
national centre for tropical wetland research
C/- ERISS, Locked Bag 2, Jabiru, NT 0886
email abbies@eriss.erin.gov.au
tel. (08) 89799793

ASL 2000 – Accommodation

Please note: Book accommodation as early as possible, as July is a very busy time in Darwin and accommodation is much in demand. All suggestions below (excluding North Flinders International House) are located in or around the city centre.
Note that the conference is being held at the Northern Territory University, ~15 km from the city centre and main hotels and hostels. If you choose to stay in the city we will provide daily bus transport to and from the university.

Name	Location	Description	Cost per night
Air Raid City Lodge Tel. 08 89819214	35 Cavenagh St	Single	$55
		Double	$65
		Triple	$75
		Family	$85
Asti Motel Tel. 08 89818200	7 Packard Pl., cnr Smith St, Larrakeyah	Single	$99
		Double	$104
		Studio unit (1 x double, 2 x single)	$126.50
Banyan View Lodge (Weekly rate: 7 nights for price of 6) Tel. 08 89818644	119 Mitchell St	Single	$34 – $39 (+GST)
		Double	$44 – $49 (+GST)
		Bedsitter	$55 (+GST)
Mirambeena Tel. 08 89460111	64 Cavenagh St	Standard room	$104 (+GST)
		Deluxe room (2 x queen size)	$130 (+GST)
		Townhouse (1 x double, 2 x single)	$159 (+GST)
Northern Territory University – **North Flinders International House** Tel. 08 89466591	Short walk from ASL conference venue *	Single room (shared same-sex bathroom)	$45
		Single room (ensuite bathroom shared with one other room)	$50 (limited number available)
Novotel Atrium Tel. 08 89410755	100 The Esplanade	Studio	$190 (+GST)
		Superior	$210 (+GST)
		2 bedroom apartment	$270 (+GST)
Rydges Plaza Tel. 08 89820000 (Group booking ASL)	32 Mitchell St	Deluxe room **	$133
		Executive room **	$153
		Junior suite **	$203
Value Inn Tel 08 89814733	50 Mitchell St	Double / single	$70.35

* Some pre-booked rooms are available for ASL Congress attendees. Recreational facilities include TV room and table tennis. Breakfast available for $6.50 at uni cafeteria

** Govt rates available on request (~$20 less).

ASL Congress, Darwin, 7-10 July 2000

Post-congress tours

Daly River Tour

The purpose of this tour is to show people part of a catchment which is earmarked for extensive agricultural development. The extraction of surface and ground water is one of the important environmental issues for the area, and is addressed by the Environmental Flows Initiative.

The tour will be a full day. The first stop will be Oolloo Crossing on the Daly River. This part of the river has been a research site for many years, studying the pig-nosed turtle. Oolloo Crossing is an example of a typical reach of the river. By walking along the edge of the river, features of the Daly such as the sandy and rocky bottom, shallow depth, *Valisinaria* beds and hopefully some of the fauna (turtles, fish and crocodiles) may be seen. It will also demonstrate the extremes in hydrology regularly experienced by the river every wet season.

The next stop will be Douglas-Daly Park. The nearby Douglas River highlights the importance of groundwater flows in the Daly River Basin in sustaining surface flows in the Daly River year-round. The Douglas River is also a nice example of a tropical river with its associated vegetation and deep banks. A BBQ lunch will be provided at this stop. There will be opportunity here to swim, fish or just explore the riverbanks. Depending on the road conditions and group size, an interesting walk to the confluence of the Douglas River and Hayes Creek may form part of this tour.

If time allows, the tour will stop at the Douglas Hot Springs on the way home. Here, in addition to the interest of the thermal springs, the Douglas River is more open and broader than at the previous site. This site emphasises the importance of groundwater in the region, and highlights the diversity of rivers. Swimming is allowed here.

Tour cost $55 per person.

Cost includes transport, pick-up and return from the city and NTU campus and BBQ lunch. Some refreshments will be also provided on board the bus.

What to bring Hat, sunscreen, bathers, towel, and fishing line if you're keen!

Mary River Wetlands Tour

The purpose of this tour is to present to people some of the issues affecting some of the lower catchment floodplains common across the Top End coastline. The Mary River floodplain will be the focus of the tour, with some additional views and comment on adjacent catchments such as the Adelaide River. The predominant land use activities in these areas include horticulture, improved pasture, grazing, mining, extensive tourism and recreational fishing. Some of the problems facing these wetland areas include salt-water intrusion and the spread of introduced weeds such as *Mimosa pigra*.

The tour will be a full day. The first stop will be Fogg Dam, providing an opportunity to view some of the bird-life common to wetland areas, as well as some of the macrophyte types dominant in these wetlands.

The next stop on the agenda will be a brief visit to the *Windows on the Wetlands* display centre. From this viewing area it will be possible to see the extent of the *Mimosa pigra* problem and discuss measures adopted for control of this introduced weed. Additional displays at the Centre are also very informative.

The tour will then continue on to Shady Camp Barrage on the Mary River, to view one of the barrages constructed to halt saline intrusion inland into the paperbark swamps. There is also a strong possibility of seeing a Salt-water Crocodile from the viewing area provided at the barrage. Additional information on the crocodiles is provided on display boards and I'm sure the elected guides will also illuminate the major reason for 'interesting' results when sampling these Top End waterways, with some chilling crocodile tales.

Lunch will be provided at Shady Camp under the banyan trees and there may also be the opportunity for keen anglers to throw in a line and brave the crocodiles in a hunt for the prized Barramundi.

An optional extra included in the tour at this point is a possible 15-minute 'chance of a lifetime' helicopter flight over the lower wetland areas. Spectacular views of the extensive barrage system, the paperbark swamps affected by salt-water intrusion, and the revegetation occurring since barrage construction will make this flight a trip never to be forgotten. A minimum of 20 people will be required to make this tour available at the indicated cost.

From the salt-water edge of the wetlands, the tour then proceeds back to the Rockhole billabong system where a 2-hour boat cruise will meander through this popular nature and recreational fishing spot. Here is another opportunity to see a fascinating conservation area, with brief discussions of issues affecting this system and research being carried out in the area. Have those cameras ready for this cruise!

Once the cruise has finished the tour will return to Darwin, after a day guaranteed to make all visitors extremely impressed with our spectacular Territory wetlands!

Tour cost $95.00 (add $120 per head for helicopter trip –20 people minimum)

Cost includes transport, pick up and return from the city and NTU campus, 2hr-boat cruise, lunch and other refreshments.

What to bring Hat, sunscreen, camera and binoculars if you're a keen bird watcher. Please don't bother bringing bathers and a towel as the crocodiles do enjoy having the odd tourist for tea!

Tour details provided by staff from the NT Department of Lands, Planning and the Environment, a sponsor of the ASL Congress 2000.

A two-day post-congress tour of Kakadu National Park may also be organised if there is enough interest. To register your interest in one of the post-congress tours, please tick the relevant boxes in the ASL Congress registration form, available on the ASL web site at http://www.asl.org.au.

For more information please contact
Abbie Spiers
national centre for tropical wetland research
C/- ERISS, Locked Bag 2, Jabiru, NT 0886email
abbies@eriss.erin.gov.au
tel. (08) 89799793

ASL VICTORIAN CHAPTER 2000

After last year's resounding success we have decided to continue the Victorian ASL Chapter Seminar Series. Before we commence the pub nights we have a special event to kick start the series. In collaboration with our marine counterparts we have a joint meeting with AMSA, where two leading aquatic scientists will review recent advances and outline challenges for the future. The talks will be followed with a dinner in Carlton. This should be a very interesting night so please come along.

ORIENTATION 2000:
Recent advances and challenges for aquatic science.
Joint meeting with Australian Marine Science Association
Prof. Barry Hart
Dr. Peter Fairweather
3rd May 2000, 7:00pm
Agar Theatre, Zoology, Melbourne University

Pub Night Series

The new season's coming-attractions include the following speakers (topics and speakers are tentative and subject to change). The venue will be the Retreat Hotel in Abbotsford as virtually everyone enjoyed the meals and facilities at this pub. Obviously confirmation of full details and abstracts will be forth coming. Please come along and enjoy these fun and informative nights. For those of you at Universities please encourage students to attend.

22nd JUNE	Dr. Ian Rutherfurd – Topic to be announced (Geomorphology)
20th JULY	Dr John Keohn – Fish: Where are we?
24th AUGUST	Dr Chris Walsh – Urban Aquatic Ecology
21st SEPTEMBER	Dr Ben Gawne – Lower Murray River Ecology
20th OCTOBER	Dr Michael Reid – Palaeolimnological studies of the Murray River.

The Retreat Hotel, 226 Nicholson Street, Abbotsford
Dinner from 6:30pm, talks begin 8:00pm

AUDIT

Audit Opinion

In our opinion, the financial report presents fairly the financial position of the Australian Society for Limnology Inc. as at 31 December 1998 and the results of its operations for the year then ended.

LINDSAY C COSTER FCA
Chartered Accountant

AUSTRALIAN SOCIETY FOR LIMNOLOGY INC

PROFIT AND LOSS STATEMENT FOR YEAR ENDED 31 DECEMBER 1998

	1998 $	1997 $
INCOME		
Bank Interest	3,619	2,032
Congress	54,444	4,563
Intercol 1996 - Donation Refund		2,000
Special Publications	100	77
Subscriptions - Members	11,020	14,385
- Students	1,033	1,820
- Institutions	230	800
-10 Year	975	2,115
TOTAL INCOME	71,421	27,792
EXPENSES		
Audit Fees	728	590
Bank Charges	831	357
Telephone	1,389	945
Congress	56,664	5,343
- Student Travel Award	1,000	500
- Student Prize	300	400
- Books & Artwork	226	
Depreciation	820	1,171
Gifts		59
Honorarium	1,500	1,500
Insurance - Computer	200	200
Miscellaneous	34	32
Newsletter	5,963	7,444
Special Publication	4,014	
Sponsorship - Fitzroy River	1,000	
Stationery/Printing/Office Supplies/Postage	686	862
Subscriptions - FASTS	2,205	2,205
TOTAL EXPENSES	77,561	21,608
NET SURPLUS FOR YEAR	$ (6,141)	$ 6,184
RETAINED SURPLUS AT START OF YEAR	73,255	67,071

RETAINED SURPLUS AT END OF YEAR	$ 67,114	$ 73,255

AUSTRALIAN SOCIETY FOR LIMNOLOGY INC

BALANCE SHEET AS AT 31 DECEMBER 1998

	1998 $	1997 $
MEMBERS FUNDS		
Retained Surplus	67,114	73,255
Represented by:		
CURRENT ASSETS		
General Bank Account	14,327	21,789
A.N.Z. Trustees Common Fund V2 Plus	21,556	20,724
N.A.B. Deposit at call	15,000	31,692
N.A.B. Deposit at call	18,000	
TOTAL CURRENT ASSETS	68,883	74,205
NON CURRENT ASSETS		
Office Equipment	5,653	5,653
less Provision for Depreciation	4,422	3,603
TOTAL NON CURRENT ASSETS	1,231	2,050
TOTAL ASSETS	70,114	76,255
NON CURRENT LIABILITIES		
Advance - Intecol Conference Donation for SIL 2001	3,000	3,000
NET ASSETS	67,114	73,255

AUSTRALIAN SOCIETY FOR LIMNOLOGY INC

DEPRECIATION SCHEDULE FOR YEAR ENDED 31 DECEMBER 1998

OFFICE EQUIPMENT

	Acquired	Cost	O.W.D.V.	Rate	Deprec	C.W.D.V.
		$	$	%	$	$
Computer	10/2/95	3,290.00	1,066.00	40%	426.40	639.60
Printer	10/3/95	1,995.00	646.00	40%	258.40	387.60
Modem	3/14/97	368.00	339.00	40%	135.60	203.40
		5,653.00	2,051.00		820.40	1,230.60

AUSTRALIAN SOCIETY FOR LIMNOLOGY (ASL) MAILING LIST AND HOME PAGE

The Australian Society for Limnology (ASL) email list has a new address! This list is an unmoderated, public list open to members of ASL and other interested parties. The list has been established to encourage discussion of limnological issues and to facilitate the rapid transfer of information to members of the ASL. This new list replaces the old ASL email list which operated from Northern Territory University until 31/12/99.

Examples of the sorts of things that may be of interest to subscribers on this list include:
- announcements of seminars, conferences and workshops
- discussion of topical issues
- requests for information and collaboration
- job and scholarship advertisements
- issues related to ASL business

The new list offers the subscriber access to the emailing list archives, of which more than the last 100 list messages that were sent to this list are stored.

To subscribe to the ASL email list, send a blank email to:

ASL-subscribe@asl.org.au

and make sure there is nothing in the body of the email, including any auto signatures.

Any queries relating to this list can be sent to the ASL webmaster via email at:
webmaster@asl.org.au

And don't forget the ASL website located at:

http://www.asl.org.au

The homepage contains:
- information about the ASL
- a list of members of the executive
- the list of volunteers
- policy documents
- membership information including application via the web
- conference information
- links to other limnological sites.

The site is fairly new, but is developing rapidly. Please visit the site and forward any comments or suggestions for what you would like to see added to the site, to the ASL webmaster

webmaster@asl.org.au

Enjoy the list! (message from Simon Josey)

AUSTRALIA'S AQUATIC AND WETLAND RESOURCES: THE CRITICAL CHALLENGES

Prepared by the Australian Society for Limnology (ASL)
February 2000

Priority Challenges

Australia has a poor record of managing and using aquatic and wetland resources. Throughout the country, aquatic habitats such as rivers, swamps and lakes have been degraded and destroyed for short-term unsustainable gain. This short-sighted behaviour has placed the well-being of future generations of Australians in jeopardy.

Maintaining Australia's ***aquatic habitats and their associated biodiversity in a healthy state is fundamental to their existence and our well-being.*** In a healthy state, aquatic and wetland resources can also provide many ***goods and services*** of great benefit to society that have often gone unheralded (apart from a water supply). These goods and services include:

- ***Products*** –fisheries, agricultural; foraging and forest; and wildlife resources; recreation, ecotourism.
- ***Functions*** – flood control; nutrient, sediment and contaminant retention; shoreline stabilisation and erosion mitigation; stabilisation of local climatic conditions; and food web support.
- ***Attributes*** –unique biodiversity, cultural and historical features.

To stop and even reverse the destruction of our natural heritage is ***the responsibility of all sectors of society***. Policy makers, scientists, and the managers and users of wetlands, lakes, streams and other aquatic habitats have a particular obligation to find appropriate solutions that balance the provision of goods and services with ecosystem protection.

This document lists nine critical challenges that require urgent action to ***stop and reverse the loss and degradation*** of Australia's aquatic resources and habitats. Local or regional priorities may differ, but at a national level the challenges are clear. The nine challenges are presented as being of equal urgency and importance. We urge you to consider this list and take effective actions, coordinated management and research to ensure that our legacy is not one of further loss and degradation of these habitats.

The Australian Society for Limnology

The Australian Society for Limnology (ASL) is an Australian-based scientific society whose focus is the study and management of inland waters. Established in 1961, it has a current membership of over 500 researchers, managers, engineers, teachers and tertiary level students from all states and territories. The charter of the ASL is to further our understanding of Australia's inland waters and to promote their wise use and sustainable management. From this, the society contributes to the continued existence of this valued resource and the maintenance and enhancement of the quality of life for all Australians.

The Critical Challenges

The Challenge - ***Provision of surface and groundwater for environmental benefits***

The Problem – Excessive quantities of water have been diverted from aquatic habitats by dam building, irrigation and urban water wastage without regard to the maintenance of the biological features that provide many goods and services to society. Altered flooding and drainage patterns have led to the significant loss of habitats and species.

Key Needs – Knowledge of the ecological responses to variations in flow regimes, Knowledge of the water requirements for aquatic species;

Techniques for determining appropriate water allocations; Systems for the inclusion of environmental factors in water allocation decisions.
The Challenge – ***Prevention of pollution and contamination of aquatic habitats*** **The Problem** – Aquatic habitats are still receiving excessive amounts of nutrients, toxic chemicals and other pollutants from direct and indirect sources in urban, industrial and rural settings. **Key Needs** – Knowledge of ecological responses to nutrients and pollutants; Knowledge of pollution pathways in aquatic systems; Techniques for rapid and early warning systems; Techniques for rehabilitation of polluted habitats; Techniques for low-cost treatment methods for waste.
The Challenge – ***Prevention and reduction of salinisation of wetlands*** **The Problem** – Excessive land clearance and irrigation have led to raised watertables, increasing the amount of salt entering wetlands and their associated floodplains. Saline disposal schemes directly or indirectly can add salty water to wetlands, or can otherwise alter wetland function through hydrological change. **Key Needs** –Knowledge of ecological responses to salt; Techniques to lower watertables; Techniques for the sustainable disposal of salt groundwater; Techniques for rehabilitation of polluted habitats.
The Challenge – ***Prevention of further drainage and in-filling of wetlands*** **The Problem** – Drainage and in-filling still continues at an unacceptable rate, and directly leads to the loss of habitats and biodiversity. The disruption of flows and increased flooding leads to lower retention rates of sediments and nutrients. **Key Needs** – Techniques for the rehabilitation of degraded habitats; Systems for inclusion of environmental factors in wetland management decisions.
The Challenge – ***Management of grazing in wetlands*** **The Problem** – Many of our coastal and inland wetlands and their associated floodplains continue to be overgrazed by introduced stock, leading to the loss of native species and their habitats through the loss of native vegetation, pugging, erosion and slumping of levees and banks, and localised pollution. **Key Needs** –Techniques for the rehabilitation of degraded habitats; Systems for the analysis and management of grazing pressures (including wetland protection from grazing at times of vulnerability).

The Challenge – ***Restoration and protection of Riparian (waterside) vegetation***
The Problems – Grazing and agricultural practices have degraded the protective strip of vegetation around wetlands that is essential for healthy ecosystem functioning. This has led to a reduction of carbon inputs into wetlands, increased nutrient loads, bank compaction and slumping and increased sediment loads.
Key Needs – Knowledge of nutrient and energy budgets; Techniques for the rehabilitation of degraded habitats.

The Challenge – ***Prevention and control of invasive species***
The Problem – The uncontrolled spread of invasive species has led to the loss and degradation of habitats and species, the disruption of nutrient and energy pathways, altered fire regimes and increased erosion
Key Needs – Knowledge of the ecological impacts and information on the biology of invasive species; Techniques for cost effective control; Techniques for rapid assessment; Systems for early warning and prevention of invasions.

The Challenge – ***Mitigation of climate change and sea level rise***
The Problem – Predicted climate changes are likely to lead to significant loss and degradation of habitats and species through rapid changes in water regime.
Key Needs – Knowledge of climate modelling and prediction; Techniques for holistic vulnerability assessments; Techniques for mitigation measures; Systems for improved data holdings; Systems for legislation and incentives.

The Challenge – ***Development of rigorous inventory, assessment and monitoring protocols***
The Problem – The inventory base for many aquatic habitats is poor, and assessment and monitoring programs, data management and dissemination, have often been inadequate to supply sufficient information or make useful predictions.
Key Needs – Knowledge of priority assessments of floodplain and coastal habitats; Techniques for rigorous monitoring designs; Techniques and Systems for standardised procedures for collecting, holding and disseminating information; Systems for assessing ecological health and sustainability.

ARTICLES

NASTY BLUE-GREENS KILL (AGAIN)

I wish to send some useful Limnological information from this part of world to Newsletter. A few months ago, my research students working on Cyanobacteria of freshwater semi-arid ecosystems found mass mortality of fishes and freshwater prawns in one of the man made reservoirs.

It coincided with the heavy bloom of Pseuadanabaena species. The local fishermen fixed cages to cultivate commercial fishes and they used various food items to increase the growth of fishes.

I suspect that it had acclerated the normal pace of growth of cianobacteria into rather premature exponential bloom and the consequences are loss of what they really wanted to promote. The scientific data are collected during this episodic events were little but worth revealing.

by
Prof.. Naithirithi T. Chellappa, Post-graduate Course Coordinator, Dept.Oceanografia & Limnologia, Universidade Federal do Rio Grande do Norte, Natal/RN 59.014-100, Brazil.
e-mail: chellappa@dol.ufrn.br

OBITUARY

Limnology in South Australia is poorer with the passing late last year of Dr Alan Bird. Alan has published on aquatic nematodes of the Lower Murray, but spent his career on nematodes of soil and agricultural plants. In his retirement, Alan began further studies of aquatic nematodes, particularly those of Kangaroo Island. Unfortunately he was unable to complete that work. Thankyou to a lovely gentleman, who will be missed.

I'VE BEEN TO....

Report on Biometrics 99 Conference, Hobart

The Australasian Region Biennial Conference of the International Biometric Society was held in Hobart from 12-16 December 1999.

The talks covered a wide range of topics including genetics, longitudinal studies (i.e. data collected over time), spatially correlated data, Bayesian modelling and multivariate analysis. Though few talks dealt directly with aquatic systems, many of the topics were applicable to limnology. In addition to the main conference programme, two workshops were held on the 'Analysis of correlated data using REML' and 'Non-standard Mixtures' (mainly zero-inflated data). Both of these workshops covered powerful approaches to statistical modelling that have broad applications in ecology but which are generally poorly understood by ecologists.

The application of mixed models using REML estimation was a recurrent theme throughout the conference programme. Software to access the full power of these models has been available only relatively recently. The strength of REML lies in its ability to model variance heterogeneity and covariance patterns in the data, assumptions that are often violated in ecological datasets. These methods are widely implemented in agricultural experiments but less so in ecology. An example from the conference was presented by Michelle Lorimer, Ari Verbyla (Univ. Adelaide) and Stevens of an analysis of a field trial of the growth of eucalypts under irrigation regimes with varying levels of salinity and nutrients. The trial extended over several years and included spatial correlation among samples and treatments, and was analysed as a linear mixed model.

Talks dealing with freshwater ecosystems were varied and included: Bronwyn Harch, CSIRO, assessed the downstream impact of effluent from mine wastes by analysing the Biolog plate indicator of sediment microbiological activity using Redundancy Analysis (via the CANOCO package) and Three-way Principal Components Analysis. Olivier Thas (Univ. Gent, Belgium) described a spatio-temporal model for intervention analysis in river monitoring networks. Renate Meyer and Russell Millar (Univ. Aukland) described a Bayesian state-space model for fitting stock recruitment curves for fish using the software BUGS. Judith McWhirter and Matthew Dalgety, Univ. Waikato, introduced an improved method of estimating the Most Probable Number for bacteria in a sample. Their method can be applied using an Excel application.

Tony Pettitt of Queensland University of Technology discussed some models for spatial binary data using the distribution of *Eucalyptus obliqua* in south-eastern Queensland as an example, while Petra Kuhnet and Kerry Mengersen, also of QUT, spoke on different methods of estimating prediction reliability in models (e.g. spatial predictions of species occurrence). They applied techniques like CART regression trees (also called decision trees) and smoothing splines for exploratory data analysis as aids in fitting improved predictive models using GLM and GAM models to describe the spatial distribution of the same tree species.

The workshop on non-standard mixtures — one of the signs was retitled the 'Nearly Normal Workshop' by an anonymous saboteur — dealt with zero-inflated data distributions that commonly arise with count data. These are characterised by frequency distributions with a spike of zeroes and can be considered as a mixture of two data distributions. Examples were drawn from bird surveys — relating counts of wattlebirds to different habitats and environmental covariates, and frigate bird counts obtained from a survey of a coral cay — and a study of dispersal from a release point for three species of moths. Presentations illustrated how Conditional Poisson models (Alan Welsh and Melissa Dobbie) and Extended Poisson Process models (Malcolm Faddy and Heather Podlich) can be applied to very effectively to handle these types of data.

Socially, the conference was also a success and many of the delegates made the most of Hobart, some scaling the peak of Mt Wellington on organised excursions, while others took it more sedately, sniffing the flowers on a botanical tour of the slopes. The conference dinner overlooked the harbour from the Royal Yacht Club and was followed by a dance cruise of the harbour. Most of the ANZAC males had a lean time of it on the dance floor due to the allure of one of the invited American guest speakers, although Arthur Gilmour did have some success by employing caveman tactics.

In summary, Hobart was a great spot for the conference which was very enjoyable and useful as well.

by **Hugh Jones**

CONFERENCE CAPERS

9 and 12 May The 40th Floodplain Management Conference is to be held in Parramatta at the Parkroyal Hotel between. This conference is being jointly hosted by Parramatta City Council, Holroyd City Council and the Upper Parramatta River Catchment Trust. For further information please contact Margaret Reid on phone (02) 8904 0800 or mreidpl@intercoast.com.au

on 25 and 26 May - The 3rd Queensland Environmental Conference: Sustainable Environmental Solutions for Industry and Government, is to be held in Brisbane at the Sheraton Hotel and Towers. For further details regarding registration or the conference in general, please contact the following: Mr Keron Gaul (07) 3831 6744 or kwgaul@wbmpl.com.au (conference information) or Mr Barry Snashall (07) 3832 3749 or bsnashall@ieaust.org.au (registration issues).

July 3-7, 2000 - New trends in water and environmental engineering for safety and life: Eco-compatible solutions for aquatic environments, Capri, Italy. Contact Terr@A. Dept. IIAR, Hydraulic Div. Politecnico di Milano, Piazza L. da Vinci 32, 20133 MILANO (ITALY), Fax +39 02 23996298, Ph. +39 02 23996293, E-mail:terra@marina.iar.polimi.it

July 12-14, 2000, 4th International Symposium on Spatial Accuracy Assessment in Natural Resources and Environmental Sciences. Inquires B.M. Gerard, Heuvelink, Institute for Biodiversity and Ecosystem Dynamics, University of Amsterdam, Nieuwe Prinsengracgt 130, 1018 VZ Amsterdam, The Netherlands, email accuray@frw.ava.nl. www: http:/www.gis.wua.nl./Accuracy20000.

August 7-13, 2000, Australian Society for Fish Biology Conference, Albury NSW. Details can be found at http://www.hydro.com.au/asfb/

25August - 1 September, 2000 - International Diatom Symposium. Greece, registration forms at www.uoa.gr/IDS2000. A limited number of cabins have been reserved on the cruise (and also in the Congress hotel) and there is already a waiting list of other travellers. To secure cabins, please, effect a remittance of 300 US$ (non refundable) per person till January 25, 2000 to: CITYBANK NA, Kolonaki Branch, Athens-Greece, Post code 10676, Athena Amilli-IDS 2000- Acount Number 5504128069. Fax, please, a copy of receipt to 0030-1-7274325. After the end of January we cannot guarantee participation in the cruise (or accommodation in the congress hotel). The remaining expenses for hotel and cruise accommodation can be paid at the latest till May 1, 2000.

4- 8 December, 2000. Molluscs 2000 – Understanding Molluscan Diversity in our Region into the 21st Centuary. University of Sydney, Sydney. Contact Winston Ponder, Dpt of Malacology, Australian Museum, 6 College St, Sydney, 2000 www: http://www.austmus.gov.au/science/division/ invert/mal/malsoc/confer3.htm

FURTHER IN THE FUTURE

28th International Association of Theoretical and Applied Limnology (SIL): February 2001, Melbourne, Australia

9th International Congress on Invertebrate Reproduction and Development: Rhodes 15-20July 2001 University, Grahamstown, South Africa. Inquires Alan Hodgson, Rhodes University 6140 South Africa ph (+46) 6038526 fax (+46) 6224377.

29th International Association of Theoretical and Applied Limnology (SIL): August, 2004. Helsinki, Finland.

BOOK REVIEWS

Rock of Ages – human use and natural history of Australian granites. Ian Bayly, 1999. University of Western Australia Press, Nedlands, WA. 132 pp. $34.95, pb; $45.00 hb.

This is not a book whose title one might associate immediately with freshwater ecosystems or a book that one might expect from a limnologist. It is, in part, a biological account of an island ecosystem – granite outcrops – and emphasises the unique characteristics of such island communities. The author was first attracted to these habitats when he began studying the invertebrate life in the water-filled rockholes ("islands on islands" according to the author) on these outcrops in WA. This interest led to a deeper appreciation of the nature of these ecosystems, which includes not only their biological value but also their aesthetic and spiritual value. To quote from the preface, this book provides "a pathway for others to obtain as much pleasure and enjoyment as I have had from the exploration of granites".

The book is divided into 11 chapters. The first three deal with the geology of granites in Australia, the use (for building) of the rock e.g. for the piers and pylons of the Sydney Harbour Bridge, and their value as impermeable surfaces from which water can be harvested. This last characteristic may strike those who have never seen these granite outcrops as odd. However, water shortage forced early settlers in WA and on the Eyre Peninsula of South Australia to use slabs of granite to form low walls which directed run-off from the outcrops into reservoirs either on the rock itself or at its base. Natural rock holes on the outcrops, known as gnammas by the Aborigines, were naturally of vital importance. A further chapter is devoted to their description and classification and to accounts from explorers' journals indicating the (often cruel) ways in which information on their location was obtained from local tribes.

The next five chapters deal with biological aspects: the aquatic life in gnammas (invertebrates as well as plants) and the nature of the food web and energy flow in what seems a very unpromising habitat; the lichens, mosses and herbs found on the granite surface; life in water seeping from patches of moss; the shrubs and trees characteristic of granite surfaces; and the terrestrial animals (invertebrates, reptiles and marsupials) associated with granite outcrops. These chapters summarise what is known at a level of detail that will appeal to many non-specialists.

The two final chapters cover aesthetics, recreation and conservation. The author remarks on the similarity between some outcrops and sculptures (by Henry Moore for example) and notes the widespread practice, in Europe for instance, of arranging large rocks (often granite) into circles, which may have functioned originally as solar calendars but later acquired religious or spiritual significance. Aboriginal arrangements of granite stones are noted from both western and eastern Australia. The conservation value of the outcrops stems from their use as refuges, especially by strictly freshwater organisms that in WA are surrounded by a sea of highly saline lakes.

This is an idiosyncratic book written by an enthusiast for a habitat that to many may seem sterile and unremarkable. Numerous excellent photographs by the author supplement the text. It is a fine example of how knowledge of natural and human history can transform one's view of a landscape. I'd recommend it to everyone.

by **Richard Marchant**

International Watercourses: Enhancing Cooperation and Management Conflict Proceedings of a World Bank Seminar held in November 1997, World Bank Technical Paper No 414. Edited by M.A. Salman and Laurence Boison Chazournes

The publication contains the papers presented to the Seminar in 10 Chapters.

The first chapter "Regulation of the Uses of International Water Courses" by **Lucius Caflisch**, deals with International Law applying to International Watercourses (IWC) regarding Navigational and Non-navigational Law of IWCS.

"The UN Convention of the Law of the Non-navigational Uses of International Watercourses: Prospects and Pitfalls" is by **Stephen McCaffrey**. The Law was adopted by the UN General Assembly, May 21, 1997. It's 33 Articles are analysed in detail. Chapter 3 "The Evolution and Context of the Bank Policy for Projects on International Waterways" is by **Raj Krishna.** In the 1950's the World Bank switched from construction to development funding, to be provided only if there was agreement of the riparians. This is claimed to be consistent with international law rules related to IWC.

"UNIECE Strategies for Protecting the Environment with Respect to International Watercourses: The Helsinki and Espoo Convention" is dealt- with by **Branco Bosnjakovic.** The Helsinki Convention of October 1996, resulting in the Helsinki Declaration came into force October 1996.

At Espoo, Finland an EIA Convention was held in February 1994 entering into force September 1994. The Convention covers 17 groups of activities examined in detail.

Laurence Boisson de Chazourenes, deals with "Elements of a Legal Strategy for Managing International Watercourses: The Aral Sea". The Aral Sea was once the fourth largest inland body of water, now shriveled to half its former area and a third of its volume.

The rivers Amu Darya and Syr Darya terminating in this inland sea, flow through five separate Central Asian Republics. In recognition of the crisis an Aral Sea Basin Program (ASBP) was adopted by these countries.

"Managing International Waters in Africa: Process and Progress" is presented by **Rafic Hirji and David Grey**. Africa contains 80 international river and lake basins.

The Volta River is shared by 6 countries, but there are no treaties and no river basin organisations. The relationships between these countries is complex.

Lake Victoria is the largest water body in Africa with a surface area of 68,000 km2. Water from the Lake supplies about 25 million people surrounding it, in three countries. Strategies to satisfy existing skills are to be prepared at national and international level. The SDADAC Protocol on shared Water Course Systems adopted by the states in 1995 facilitates resolution of allocation and rights issues.

"Water Courses, Environment and the International Court of Justice: Gabcikovo-Nagymaros Case" is examined by **Phillipe Sands**. The Gabcikovo-Nagymaros project for dams on the Danube River was

complex and subject to much antagonism. Details of the project, its history and finally the verdict of the International Court of Justice is presented with all the technicalities.

"Sharing the Ganges Waters between India and Bangladesh: An Analysis of the 1996 Treaty" is examined by **Salman H.A. Salman**. Agreement on sharing the waters of the Ganges River between India and Bangladesh has been a difficult problem for many years. An atmosphere conducive to reaching agreement has been created.

"The Role of the World Bank in Enhancing Cooperation and Resolving Conflict on International Watercourses: The Case of the Indus Basin" is presented by **G.T. Keith Pittman**. Under British rule, before Independence and the separation of India and Pakistan, the Indus Basin contained the largest integrated irrigation system in the world. In 1947 partition occurred with Independence. The result was that India had a population of 21 million and Pakistan 25 million.

After much difficulty and with "Shuttle Diplomacy" and with a significant contribution by the World Bank, in September 1960 the Indus Treaty was finally signed.

The final chapter is an overall conclusion: "International Water- courses: Enhancing Cooperation and Managing Conflict" it is dealt with by **H.A. Salman and Laurence Boisson de Charzoures**, authors of earlier papers. This chapter summarises the proceeding chapters, underscoring the fact that water is a scarce resource, with competing demands by a wide array of users. The number of treaties, international and regional which have been concluded in this area are listed. The need for cooperation in management utilisation and protection of international watercourses in various areas around the world is stressed.

There are three Annexes, they contain
1. Convention on the law of the Non-Navigational Uses of International Watercourses, signed 21st May 1997
2. World Bank Operational Manual
    A. Operational Policies
    B. Bank Procedures
    C. Good Practices
3. Convention on the Protection and Use of Transboundary Watercourses and International Lakes, finalised at Helsinki on 17 March 1992

This assembly of papers is an analysis of disputes, cooperation as well as treaties between countries transected by international watercourses or bordered by lakes in many parts of the globe and the role of the World Bank. Extensive detail is presented clearly.' Information about the problems, environmental implications, the disputes and in many cases the solution in treaties is set out.

A regrettable omission is that, with one exception, illustrations or maps of the extensive river basins and lakes are not included. Overall it is a valuable contribution to the topic of management of international watercourses.

Although it is not covered in this book, it might be relevant to indicate that, in Australia disputes about interstate rivers have to be referred to and are dealt with by two bodies. They are the Murray-Darling Basin Commission and the Dumaresq-Barwon Border Rivers Commission.

This is a longer than usual book review, due to the numerous authors whose subject matters concern a number of significant, unique water ways in different locations throughout the world.
by **Hans Bandler**, B.E., M.Se

ASL VOLUNTEERS

The following people have volunteered to speak as experts on behalf of the ASL. If you wish to be included on the list contact:

Dr Richard Marchant (ASL Secretary)
Email: rmarch@pioneer.mov.vic.gov.au

The following members are prepared to speak on behalf of the ASL on their area of expertise.

Name	Area of Expertise	Contact Details
Prof A. Arthington	in stream flows, ecology of exotic fishes, conservation of rare fishes.	Centre for Catchment & Instream Res, Griffith University, Nathan Qld. 4111. Phone (07)275 7403 , Fax: (07)277 3759
Dr P. Boon	Bacteriological issues, wetlands.	Environmental Management, Victoria University of Tech., PO Box 14428 MMC, Vic. 3000. Phone (03)9365 2214, Fax (03) 9365 2465. email: paul.boon@vut.edu.au
Dr A. Boulton	Intermittent streams, hyporheic zones, Flinders Ranges	Ecosystem Management, University of New England, Armidale, NSW 2351. Phone (02) 67733760, Fax (02) 67732 769 email: aboulton@metz.une.edu.au
Dr M. Brock	temporary wetlands, aquatic plants	Botany Department, University of New England, Armidale NSW 2351. Phone (02)67732 578, Fax (02)67733 283 email: mbrock@metz.une.edu.au
Dr S. Bunn	stream ecology, ecology of riparian zones, biomonitoring	Faculty of Environmental Sciences, Griffith University, Nathan, Qld 4111. Phone (07)8757 407, Fax (07)875 7459, email: s.bunn@ens.gu.edu.au
Dr T. Entwisle	taxonomy and ecology of freshwater macroalgae	Royal Botanic Gardens, Mrs Macquaries Road Sydney NSW 2000 phone 02 9231 8113, fax 02 9251 4403 email tim_entwisle@rbgsyd.gov.au
Dr M. Finlayson	wetlands, Ramsar convention	Alligator Rivers Region, Office of Supervising Sci, Post Office, Jabiru, NT 0886 Phone (08) 89799756, Fax (08) 89792149 email:maxf@eriss.erin.gov.au
Dr T. Grant	platypus biology	Biological Science, University of NSW, PO Box 502, Cronulla, NSW 2230
K. Hortle	impact of mining, impact of development in Se Asia and PNG on rivers	Environmental Management, 18 Sharrow Road, Mitcham, Vic. 3132 Phone and Fax: (03) 9872 4101

Dr P. Horwitz	Conservation of freshwater invertebrates.	Dept of Science, Edith Cowan University, Joondalup Drive, Joondalup, WA 6027. Phone (08) 94055717, Fax: (08) 9300 1257 email: phorwitz@cowan.edu.au
Dr P. Humphries	fish ecology, in-stream flows	CRC Freshwater Ecology, MDFRC, PO Box 921, NSW 2640. Phone (02)6043 1002, Fax:(02)6043 1626 email: hump@watson.canberra.edu.au
Dr G. Jones	Cyanobacterial blooms	Phone: 07-3896 9516, Fax: 07-3896 9525 email:gary.jones@dnr.qld.gov.au
Dr P.S. Lake	stream ecology, conservation freshwater biota	Ecology & Evolutionary Biology, Monash University, Wellington Road, Clayton, Vic. 3168. Phone (03)9055 653, Fax:(03)9055613 email:p.s.lake@sci.monash.edu.au
Dr V. Matveev	plankton food webs, biomanipulation	MDFRC, PO Box 521, Albury, NSW 2640. Phone: (060) 431002, Fax: (060) 431626.
Dr R. Pearson	tropical freshwater ecology	Zoology Dept. ACTFR, James Cook, University, Townsville, Qld. 4811. Phone:(077) 814 262, Fax: (077)79 6371
Dr W. Ponder	freshwater molluscs	Malacology, Australian Museum, 6 College Street, SYDNEY 2000 Ph: (02) 9320 6120 Fax (02) 9320 6050 Email:winstonp@amsg.austmus.gov.au
J. Puckridge	ecology of arid zone rivers, ecology of freshwater fish	CRCFE, Zoology Department, University of Adelaide, Adelaide, SA 5005. Phone (08) 83034455. Fax: (08) 8303 4364 email:jpuckrid@zoology.adelaide.edu.au
Dr N. Rea	wetland plant ecology, water regime, weeds and conservation	Water Quality Branch, Department Lands, Planning and Environment PO Box 567 Palmerston NT 0831 Phone (08) 8924 6403, Fax: (08) 8924 6410, email: naomi.rea@nt.gov.au
Dr R. Shiel	planktonic & littoral microfauna, billabong ecology.	MDFRC, PO Box 921, NSW, 2640. Phone (02)60431002, Fax: (02)60431626 shielr@mdfrc.canberra.edu.au
Dr L. Townley	groundwater-surface water interaction.	CSIRO Division of Water Resources, Private Bag, Wembley, WA 6014 Phone (08) 9387 0329, Fax: (08) 93878211
Prof. W.D. Williams	Salt lakes	Zoology Dept, University Adelaide, Adelaide SA 5005. Phone (08) 8303 4455, Fax: (08) 83034364

REGIONAL EXECUTIVE MEMBERS 1990-2000

NSW Ms Deb Nias
Dept Land and Water Conservation, PO Box 380, Dareton NSW 2717
ph: 03-50274303, fax: 03-50274769; email: dnias@dlwc.nsw.gov.au

Qld Dr Gary Jones
CSIRO Land & Water, Sciences Centre, 80 Meiers Rd., Indooroopilly, Qld 4068
Ph: 07-3896-9516 Fax: 07-3896-9525
Email: gary.jones@dnr.qld.gov.au

SA Ms Kerri Muller
Botany Dept, University of Adelaide, SA 5005
Ph: 08-8303 4560 Fax: 08-8232 3297
Email: kmuller@botany.adelaide.edu.au

WA Dr Jenny Davis
School of Environmental Sciences, Murdoch University, Murdoch WA 6150
Ph: 08-9360 2939 Fax: 08-9310 4997
Email: davis@essun1.murdoch.edu.au

ACT Dr Ralph Ogden
Dept. of Applied Science, University of Canberra, PO Box 1, Belconnen ACT 2616
Ph: 02-6201 2033
Email: ogden@science.canberra.edu.au

NT Ms Ruth O'Connor
School of Biological Sciences, Northern Territory University, Darwin NT 0909
Ph 08-8946 6761 Fax 08-8946 6847
Email: r_oconnor@banks.ntu.edu.au

VIC Ms Rhonda Butcher
Dept. Ecology & Evolutionary Biology, Monash University, Clayton, VIC 3168
Ph: 03- 9905 5643 Fax: 03-9905 5613
Email: rhonda.butcher@sci.monash.edu.au

Tas Dr Jean Jackson
118 Wentworth Street, South Hobart, Tas 7004
Ph: 03-62237133 Fax: 03-62237133
Email: jeanj@ifc.tas.gov.au

EDITORIAL ADDRESS

Ivor Growns, NSW Fisheries, Private Bag 1, Nelson Bay, NSW 2315
ph (02) 4982 1232 fax (02) 4982 2265 email grownsi@yahoo.com.au

If not deliverable please return to:
Australian Society for Limnology
22 Netherby Ave
Wheelers Hill, VIC, 3150

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Dr R. Marchant
Invertebrate Survey
Museum of Victoria
71 Victoria Cres
Abbotsford
VIC 3067